

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY	
1.1 Product identifier	
Trade name:	Ammonium Nitrate 33.5 – 34.5 N
Other names:	Ammonium Nitrate
Chemical name:	Nitric acid ammonium salt
INDEX number as listed in Annex VI of CLP:	Not listed in an Annex VI / CLP.
ID number of the C&L inventory:	Not listed in an Annex VI / CLP.
CAS number:	
REACH registration no(s):	
1.2 Relevant identified uses of the substance or mixture and uses advised against	
Uses:	<p><u>Uses by workers in industrial settings:</u></p> <p>1: Manufacturing of the substance, including handling, storage and quality control.</p> <p>2: Sampling, loading, filling, transfer, dumping, bagging of substance (charging/discharging) at (non-)dedicated facilities. Industrial/professional settings.</p> <p>3: Storage</p> <p>4: Transfer of substance into small containers (dedicated filling line, including weighing). Industrial/professional setting.</p> <p>5: Quality control</p> <p>6: Use of ammonium nitrate in the manufacturing of formulations for adhesives and sealants, explosives, fertilizers and water treatment chemicals</p> <p>7: Treating or coating of seed with fertilizer containing ammonium nitrate</p> <p>8: Use of ammonium nitrate as an intermediate to synthesize other substances</p> <p><u>Uses by professional workers:</u></p> <p>9: Spraying</p> <p>10: Professional use of fertilizers containing ammonium nitrate – liquid fertigation at open field (non industrial spraying)</p> <p>11: Professional use of fertilizers containing ammonium nitrate – liquid fertigation in the soil</p> <p>12: Professional use of fertilizers containing ammonium nitrate – fertigation at open field</p> <p>13: Professional use of fertilizers containing ammonium nitrate – outdoor mixing</p> <p>14: Professional use of fertilizers containing ammonium nitrate –</p>

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010



	indoor mixing 15: Professional use of fertilizers containing ammonium nitrate – greenhouse liquid fertigation in the soil 16: Professional use of fertilizers containing ammonium nitrate – greenhouse liquid fertigation (non industrial spraying) <u>Uses by consumers:</u> 17: Consumer end use – fertilization at open field 18: Consumer end use – indoor use of fertilizers 19: Consumer end use – matches and fireworks
Uses advised against:	None
1.3 Details of the supplier of the safety data sheet	
Manufacturer/Importer/Supplier:	
Person responsible for the manufacturing	
Person responsible for the Safety Data Sheet (with e-mail address)	
1.4 Emergency telephone number	
Emergency phone number:	

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

		Institute Pirogof
2. HAZARDS IDENTIFICATION		
2.1 Classification of the substance		
Classification in accordance with Regulation 1272/2008 (CLP)		
Hazard statement(s):	H272 H319	Cat.3 - May intensify fire; oxidiser. Cat.2 - Causes serious eye irritation.
Classification in accordance with Directive 67/548 (DSD)		
Risk phrase(s):	R8 R36	Oxidising; Contact with combustible material may cause fire. Irritant; Irritating to eyes.
2.2 Label elements		
Labelling in accordance with Regulation 1272/2008 (CLP)		
Hazard pictogram(s):		
Signal word	Warning	
Hazard statement(s):	H272 H319	Cat.3 - May intensify fire; oxidiser. Cat.2 - Causes serious eye irritation.
Precautionary statement(s):	P210 P220 P370+P378 P264 P280 P305+P351+P338	Keep away from heat/ sparks/open flames/hot surfaces. — No smoking. Keep/Store away from clothing and combustible materials. In case of fire: Use water for extinction. Wash hands thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
In case of a mixture: Labelling in accordance with 1999/45 (DPD)		
Hazard symbol(s):	 Xi:Irritant, O: Oxidizing	
Risk phrase(s):	R8 R36	Oxidising; Contact with combustible material may cause fire. Irritant; Irritating to eyes.

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Safety phrase(s):	S2	Keep out of the reach of children		
	S17	Keep away from combustible material		
	S25	Avoid contact with eyes		
	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice		
	S46	If swallowed, seek medical advice immediately and show this container or label		
2.3 Other hazards				
PBT/vPvB criteria:	According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted since ammonium nitrate is inorganic.			
Other hazards:	None known			
3. COMPOSITION / INFORMATION ON INGREDIENTS				
Substances/preparation:				
According to the REACH Regulation the product is a mono-constituent, based on an Ammonium Nitrate and inert filler Aluminium Sulphate. It is possible this product to be treated with ant caking agent. This product is relevant with EU Regulation on a fertilizers 2003 / 2003.				
Chemical name	CAS no.	EC no.	IUPAC name	Purity
Nitric acid ammonium salt	6484-52-2	229-347-8	ammonium nitrate	> 97%
Impurities:				
Total combustible ingredients as a Carbon: much below 0.2 %.				
Chlorides: below 0.02 %				
Copper: below 10 ppm				
4. FIRST-AID MEASURES				
4.1 Description of first aid measures				
Eye contact:	Immediately wash eyes with plenty of running water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses if present and easy to do. Seek medical advice if irritation develops and persists.			
Skin contact:	Wash affected skin area with plenty of water and soap for at least 15 minutes thoroughly while removing contaminated clothing and shoes. Seek medical advice if irritation develops and persists			
Ingestion:	Seek medical advice if the victim feels unwell. Wash out mouth with plenty of water and give plenty of water to drink. Do not induce vomiting. Never give anything by mouth to an unconscious person. Seek medical advice if symptoms occur.			

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Inhalation:	Remove the victim from exposure into fresh air immediately if adverse effects (e.g. dizziness, drowsiness or respiratory irritation) occur. If not breathing, give artificial respiration or if breathing is difficult, give oxygen and seek medical advice. Do not use mouth-to-mouth respiration. Seek medical advice immediately when vapors are intensively inhaled.
4.2 Most important symptoms and effects	
Acute effects	Eye irritation
Delayed effects	None known
4.3 Indication of any immediate medical attention and special treatment needed	
Note to physician: Methaemoglobinaemia.	
5. FIRE-FIGHTING MEASURES	
5.1 Extinguishing media	
Suitable:	Non-combustible. Water.
Not suitable:	Combustible material.
5.2 Special hazards arising from the substance or mixture	
May be explosive in contact with flammable or organic substances and at confinement during fire. In case of fire, may produce hazardous decomposition products such as nitrogen oxides (NO, NO ₂ etc.), ammonia (NH ₃), amines.	
5.3 Advice for firefighters	
No special measures required. In the event of fire, wear a self-contained breathing apparatus and a chemical protective suit. Use polyvalent filter. Don't dispose in a sewer.	
6. ACCIDENTAL RELEASE MEASURES	
6.1 Personal precautions, protective equipment and emergency procedures	
Avoid creating dusty conditions and prevent wind dispersal. Avoid contact with eyes, skin, and clothing. Use suitable protective equipment. Keep away from sources of ignition.	
6.2 Environmental precautions	
Prevent the material from contact with soil, entering surface water or sanitary sewer system. Do not discharge directly to a water source. If accidental spillage or washings enter drains or watercourses contact local authority.	
6.3 Methods and material for containment and cleaning up	
Vacuum or sweep up and place into suitable labelled containers for recovery or disposal. Clean up affected area with a large amount of water. Do not collect spilled material in sawdust or other combustible material. Prevent formation of dust clouds. Residual trace can be wiped away.	

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

6.4 Reference to other sections

See section 8 for personal protective equipment and section 13 for waste disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Technical measures/ Precautions:	Use with adequate ventilation. Local exhaust ventilation should be provided. Avoid contact with eyes, skin and clothing. Avoid creating dusty conditions and prevent wind dispersal. Keep away from sources of ignition. Avoid contamination by any source including metals, dust and organic materials. Keep away from moisture.
General occupation hygiene:	Do not eat, drink or smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/ Storage conditions:	Keep in the original container. Keep container tightly closed in a cool, dry, well-ventilated place. Keep product away from heat, sparks, flame and other sources of ignition, out of direct sunlight and away from combustible and reducing materials and other incompatible materials. Packaging materials: Stainless steel (304). Synthetic material. Non suitable: Zinc, Copper
Incompatible products:	Combustible and reducing materials

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Regulated occupational exposure limit values:	None																		
Recommended occupational and consumer exposure limit values (following from the performed CSA):	<table><tr><th>Exposure pattern</th><th colspan="2">Derived No Effect Level (DNEL)</th></tr><tr><td></td><th>Workers</th><th>General population</th></tr><tr><td>Oral¹</td><td>Not applicable</td><td>12.8 mg/kg bw/d</td></tr><tr><td>Dermal¹</td><td>21.3 mg/kg bw/day</td><td>12.8 mg/kg bw/day</td></tr><tr><td>Inhalation¹</td><td>37.6 mg/m³</td><td>11.1 mg/m³</td></tr><tr><td></td><td></td><td></td></tr></table> <p>¹: As an acute toxicity hazard leading to Classification and Labelling of the substance has not been identified, the long-term DNEL is considered sufficient to ensure that effects from acute exposure to the substance do not occur (in accordance with ECHA Guidance on information requirements and chemical safety assessment: Chapter R.8: Characterisation of dose [concentration]-response for human health, May 2008 and Part B: Hazard Assessment, Draft new chapter B.8 Scope of</p>	Exposure pattern	Derived No Effect Level (DNEL)			Workers	General population	Oral ¹	Not applicable	12.8 mg/kg bw/d	Dermal ¹	21.3 mg/kg bw/day	12.8 mg/kg bw/day	Inhalation ¹	37.6 mg/m ³	11.1 mg/m ³			
Exposure pattern	Derived No Effect Level (DNEL)																		
	Workers	General population																	
Oral ¹	Not applicable	12.8 mg/kg bw/d																	
Dermal ¹	21.3 mg/kg bw/day	12.8 mg/kg bw/day																	
Inhalation ¹	37.6 mg/m ³	11.1 mg/m ³																	

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

	Exposure Assessment, March 2010).
8.2 Exposure controls	
Appropriate engineering controls:	None required: Use of adequate ventilation is good industrial practice. In addition, an eyewash facility and a safety shower for facilities storing or utilizing this material is good industrial practice.
Environmental exposure controls:	Dispose of rinse water in accordance with local and national regulations.
Individual protection measures, such as personal protective equipment	
Respiratory protection:	Respiratory protection
Hand protection:	Protective (heat resistant) gloves
Eye protection:	Chemical goggles or face shield
Skin and body protection:	Working clothes
Hygiene measures:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.
9. PHYSICAL AND CHEMICAL PROPERTIES	
9.1 Information on basic physical and chemical properties	
Appearance:	Transparent/white deliquescent crystals (orthorhombic at room temperature) or white granules.
Odour:	Odourless
Melting/Freezing temperature:	169.6 – 169.7°C (from peer-reviewed handbook)
Boiling temperature:	No boiling point, decomposes > 210 °C
Flash-point:	Not relevant, as the substance is an inorganic solid.
Flammability:	Non flammable (based on molecular structure).
Explosive properties:	Ammonium nitrate with less than 0.2% of combustible substances (UN 1942) is not classified as an explosive. Ammonium nitrate fertilizers falling under UN 2067 or UN 2071 do not have explosive properties either. Ammonium nitrate liquid (UN2426) is not classified as explosive substance. Ammonium nitrate with > 0.2% of combustible substances (UN 0222) is classified as an explosive substance (Class 1). UN test series 1 and 2 shows that crystalline ammonium nitrate with unknown impurity is not an explosive substance Class 1.
Oxidizing properties:	Oxidizing material accordingly EEC criteria.
Vapour pressure:	Considered negligible (based on melting and boiling point).
Relative density (D4 (20)):	1.72 (from peer-reviewed handbook)
Solubility in water:	>100 g/l at 20°C (from peer-reviewed handbook)

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Partition coefficient n-octanol/water:	Not relevant as the substance is inorganic, considered to be low (based on high water solubility)
Viscosity:	Not applicable to solids
Specific conductivity:	No data
Auto ignition temperature:	No auto-ignition (based on structure and melting point): <0.2% combustible material Not relevant (due to explosive properties): >0.2% combustible material
Surface tension:	Not surface active (based on molecular structure)
9.2 Other information	
10. STABILITY AND REACTIVITY	
10.1 Reactivity	
Stable under recommended storage and handling conditions (see section 7, handling and storage).	
10.2 Chemical stability	
Stable under recommended storage and handling conditions (see section 7, handling and storage).	
10.3 Possibility of hazardous reactions	
When heated, decomposition products.	
10.4 Conditions to avoid	
Decomposes on heating. Confinement must be avoided.	
10.5 Incompatible materials	
Reducing agents, strong acids and bases, metal powders, combustible materials, chromates, zinc, copper and copper alloys, chlorates.	
10.6 Hazardous decomposition products	
Under normal conditions of storage and use, hazardous decomposition products should not be produced. In case of fire, nitrogen oxides (NO, NO ₂).	
11. TOXICOLOGICAL INFORMATION	
11.1 Information on toxicological effects	
ACUTE TOXICITY	
Acute oral toxicity:	LD ₅₀ : 2950 mg/kg bw (OECD 401)
Acute dermal toxicity:	LD ₅₀ : > 5000 mg/kg bw (OECD 402)
Acute inhalation toxicity:	LC ₅₀ : > 88.8 mg/l (no guideline followed)
LOCAL EFFECTS	
Skin irritation:	Not irritating (OECD 404)
Eye irritation:	Irritating (OECD 405)
Skin sensitization:	Not sensitizing (OECD 429, with magnesium nitrate, nitric acid)

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

	ammonium calcium salt, sodium nitrate)
OTHER	
Sub-acute toxicity:	Oral 28-day NOAEL \geq 1500 mg/kg bw/day (OECD 422, with potassium nitrate) Oral 52-week NOAEL = 256 mg/kg bw/day (OECD 453, with ammonium sulfate) Inhalation 2-weeks NOAEL \geq 185 mg/m ³ (OECD 412)
Mutagenicity:	Negative (OECD 471, 473, with nitric acid ammonium calcium salt) Negative (OECD 476, with potassium nitrate)
Reproductive toxicity:	Oral 28-day NOAEL \geq 1500 mg/kg bw/day (OECD 422, with potassium nitrate)
Carcinogenicity:	Not carcinogenic (OECD 453, with ammonium sulfate)
12. ECOLOGICAL INFORMATION	
12.1 Toxicity	
Fish (short-term):	48-h LC ₅₀ : 447 mg/l (no guideline followed)
Fish (long-term):	No data
Daphnia magna (short-term):	48-h EC ₅₀ : 490 mg/l (no guideline followed, with potassium nitrate)
Daphnia magna (long-term):	No data
Algae:	10-d EC ₅₀ : > 1700 mg/l (seawater, no guideline followed, performed with potassium nitrate)
Inhibition of microbial activity:	3-h EC ₅₀ : >1000 mg/l, NOEC: 180 mg/l (OECD 209, with sodium nitrate)
12.2 Persistence and degradability	
Biodegradation:	Standard test is not applicable as the substance is inorganic. In addition, in the anaerobic transformation of ammonium, one group of bacteria oxidizes ammonium to nitrite while another group oxidizes nitrite into nitrate. The average biodegradation rate in wastewater plant at 20°C is 52 g N/kg dissolved solid/day. Nitrate degradation is fastest in anaerobic conditions. In the anaerobic transformation of nitrate into N ₂ , N ₂ O and NH ₃ , the biodegradation rate in wastewater plant at 20°C is 70 g N/kg dissolved solid/day.
Hydrolysis:	No hydrolysable group is present, will completely dissociate into ions.
12.3 Bioaccumulative potential	
Octanol-water partition coefficient (K _{ow}):	Not relevant as the substance is inorganic, but considered to be low (based on high water solubility)
Bioconcentration factor (BCF):	Low potential for bioaccumulation (based on substance properties).
12.4 Mobility in soil	
Adsorption coefficient:	Low potential for adsorption (based on substance properties).

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010


12.5 Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted since ammonium nitrate is inorganic.

13. DISPOSAL CONSIDERATIONS

Waste from residues:	In accordance with local and national regulations, disposed by landfill or incineration. Controlled biodegradation in waste water treatment is possible.
Container:	Containers should be cleaned by appropriate method and then re-used or disposed by landfill or incineration as appropriate, in accordance with local and national regulations. Do not remove label until container is thoroughly cleaned.

14. TRANSPORT INFORMATION

UN Number:	ADR/RID: UN2067 ADN/ADNR: UN2067 IMDG: UN2067 ICAO/IATA: UN2067
Proper shipping name:	Ammonium nitrate, based fertilizer
Transport hazard classes:	ADR/RID: 5.1 ADN/ADNR: 5.1 IMDG: 5.1 ICAO/IATA: 5.1
Packaging group:	ADR/RID: III ADN/ADNR: III IMDG: III ICAO/IATA: III
Label	
Special precautions:	ADR/RID: Hazard identification number:50. Limited quantity:: LQ12. Classification code: O2. Approved transport: B. IMDG: Emergency schedules (EmS):F-H, S-Q ICAO/IATA: Quantity limitation passenger aircraft: 10 Kg : Packaging instructions: Y516 25 Kg : Packaging instructions: Y516

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

	Quantity limitation Cargo aircraft: 100Kg Packaging instructions: 518
15. REGULATORY INFORMATION	
15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture:	Regulation EC 1907/2006 (REACH), Fertilizer Directive EC 2003 / 2003; Directive 2003/105/EC amending Council Directive 96/82/EC on the control of major – accident hazards, involving dangerous substances (so said SEVEZO II), Annex I, Part I: facilities holding more than 350 tones are concerned.
15.2 Chemical safety assessment:	In accordance with REACH Article 14, a Chemical Safety Assessment has been carried out for this substance.
16. OTHER INFORMATION	
<p>The information provided in this safety data sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any proceed, unless specified in the text.</p>	
<p>Classification in accordance with Regulation 1272/2008, as listed in Annex VI: <i>None.</i></p> <p>Classification in accordance with Regulation 1272/2008, by self-classification based on the performed CSA: <i>May intensify fire; oxidiser. (H272)</i> <i>Causes serious eye irritation (H319)</i></p>	
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SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

ANNEX

Exposure scenario (1) Manufacturing of the substance including handling, storage and quality controls	
Use descriptors related to the life cycle stage	SU8/9 PROC1/2/3/8a/8b/9/14/15 ERC1
Name of contributing environmental scenario (1) and corresponding ERC	1. Manufacturing of substances (ERC1)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Manufacturing in a closed continuous process, with occasional exposure (PROC2) 3. Use in closed batch process (synthesis or formulation) (PROC3) 4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 5. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 6. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 7. Production of preparations* or articles by tableting, compression, extrusion, pelletisation (PROC14) 8. Use as laboratory reagent (PROC15)
2.1 Contributing scenario (1) controlling environmental exposure	
Environmental release during manufacturing ERC1 An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for manufacturing of the substance including handling, storage and quality controls	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/2/3/8a/8b/9/14/15	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable.
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and	More than 4 hours per day

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

frequency (e.g. single events or repeated) of exposure	
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	<ol style="list-style-type: none"> 1. Containment as appropriate 2. Good standard of general ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	<ol style="list-style-type: none"> 1. Chemical goggles
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
<p>A qualitative approach was used to conclude safe use for workers.</p> <p>The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.</p>	
4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES	
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe	

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene.

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Exposure scenario (2) Industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings.	
Use descriptors related to the life cycle stage	SU3/10 PC1/11/12/19/37 PROC1/2/3/5/8a/8b/9/13/15 ERC2/6a
Name of contributing environmental scenario (1) and corresponding ERC	1. Formulation of preparations (ERC2) 2. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in closed, continuous process with occasional controlled exposure (PROC2) 3. Use in closed batch process (synthesis or formulation) (PROC3) 4. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC5) 5. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 6. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 7. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 8. Treatment of articles by dipping and pouring (PROC13) 9. Use as laboratory reagent (PROC15)
2.1 Contributing scenario (1) controlling environmental exposure	
Formulation of preparations (ERC2) and industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a) An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings.	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/2/3/5/8a/8b/9/13/15	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure	More than 4 hours per day
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	1. Containment as appropriate 2. Good standard of general ventilation
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	1. Chemical goggles
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
A qualitative approach was used to conclude safe use for workers.	

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Exposure scenario (3)	
Professional use in formulation of preparations and end-use	
Use descriptors related to the life cycle stage	SU22 PC12 PROC1/2/8a/8b/9/11/15/19 ERC8b/8e
Name of contributing environmental scenario (1) and corresponding ERC	1. Wide dispersive indoor use of reactive substances in open systems (ERC8b) 2. Wide dispersive outdoor use of reactive substances in open systems (ERC8e)
List of names of contributing worker scenarios (2) and corresponding PROC	1. Use in closed process, no likelihood of exposure (PROC1) 2. Use in closed, continuous process with occasional controlled exposure (PROC2) 3. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) 4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) 5. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) 6. Non industrial spraying (PROC11) 7. Use as laboratory reagent (PROC15) 8. Hand-mixing with intimate contact and only PPE available (PROC19)
2.1 Contributing scenario (1) controlling environmental exposure	
Wide dispersive indoor use of reactive substances in open systems (ERC8b) and wide dispersive outdoor use of reactive substances in open systems (ERC8e). An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
2.2 Contributing scenario (2) controlling worker exposure for professional use in formulation of preparations and end-use	
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. PROC1/2/8a/8b/9/11/15/19	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	Solid, low dustiness Liquid, >25% substance in the product
Amounts used	
Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure	Not applicable
Frequency and duration of use/exposure	
Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated)	More than 4 hours per day

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

of exposure	
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity	Not applicable
Other given operational conditions affecting workers exposure	
Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.	Indoors or outdoors
Technical conditions and measures at process level (source) to prevent release	
Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)	Not applicable
Technical conditions and measures to control dispersion from source towards the worker	
Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure	<ol style="list-style-type: none"> 1. Containment as appropriate 2. Good standard of general ventilation 3. Avoid splashing. Use specific dispensers and pumps specifically designed to prevent splashes/spills/exposure to occur
Organisational measures to prevent /limit releases, dispersion and exposure	
Specific organisational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).	Not applicable.
Conditions and measures related to personal protection, hygiene and health evaluation	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant)	<ol style="list-style-type: none"> 1. Chemical goggles
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
<p>A qualitative approach was used to conclude safe use for workers.</p> <p>The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of</p>	

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5 Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimise number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimisation of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

Exposure scenario (4)	
Consumer end-use of fertilizers and matches / fireworks	
Use descriptors related to the life cycle stage	SU21 PC11/12 ERC8b/8e/10a
Name of contributing environmental scenario (1) and corresponding ERC	<ol style="list-style-type: none"> Wide dispersive indoor use of reactive substances in open systems (ERC8b) Wide dispersive outdoor use of reactive substances in open systems (ERC8e) Wide dispersive outdoor use of long-life articles and materials with low release (ERC10a)
List of names of contributing consumer scenarios (2) and corresponding PC and sub-product categories if applicable	<ol style="list-style-type: none"> Explosives (PC11) Fertilizers (PC12)
2.1 Contributing scenario (1) controlling environmental exposure	
<p>Wide dispersive indoor use of reactive substances in open systems (ERC8b), wide dispersive outdoor use of reactive substances in open systems (ERC8e) and wide dispersive outdoor use of long-life articles and materials with low release (ERC10a).</p> <p>An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.</p>	
2.2 Contributing scenario (2) consumer end-use of fertilizers and matches/fireworks	
<p>All Product Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. Exposure to eye irritating dilutions can occur during consumer use of fertilizers (PC12). No exposure is expected from the use of matches/fireworks (PC11).</p>	
Product characteristic	
Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure	<p>Solid, low dustiness</p> <p>Liquid</p> <p>Products containing ≥10% and <10%.</p>
Amounts used	
Amounts used per event	Not applicable
Frequency and duration of use/exposure	
Duration of exposure per event and frequency of events; please note: Tier 1 exposure assessment usually refers to external event exposure, without taking into account the duration and frequency of the event (see Guidance Chapter R.15);	Not applicable
Human factors not influenced by risk management	
Particular conditions of use, e.g. body parts potentially exposed; population potentially exposed (adults, children)	Not applicable
Other given operational conditions affecting workers exposure	
Other operational conditions e.g. room volume, air exchange rate, outdoor or indoor use	Indoors or outdoors
Conditions and measures related to information and behavioral advice to consumers	
Safety advice to be communicated to consumers in	Avoid splashing

SAFETY DATA SHEET

In accordance with Regulation (EC) 1907/2006 (REACH), Annex II

Ammonium nitrate

Created on November 24, 2010

order to control exposure, e.g. technical instruction, behavioral advice;	
Conditions and measures related to personal protection and hygiene	
Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant).	<ol style="list-style-type: none">1. If $\geq 10\%$ of ammonium nitrate: Use chemical goggles2. If $< 10\%$ of ammonium nitrate: no personal protection needed3. Instructions addressed to the consumer via product labelling
3 Exposure information and reference to its source	
Information for contributing scenario 1	
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.	
Information for contributing scenario 2	
A qualitative approach was used to conclude safe use for consumers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.	
4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES	
No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers/consumers for use of fertilisers: If $\geq 10\%$ ammonium nitrate: Use chemical goggles If $< 10\%$ ammonium nitrate: No personal protection needed	